

CLAIMS

1. Wrapping apparatus for winding a wrapping film (F) about an article to be wrapped, especially an article of a shape differing from a circular shape, said wrapping apparatus comprising a film dispenser (1) arranged to revolve along a circular track (2) at a substantially constant velocity about the article to be wrapped, said film dispenser comprising: a frame (3); supporting elements (4) for supporting a film roll (5) on the frame; a pre-stretching device (6, 7) comprising a first pre-stretching roller (6) rotatably mounted on the frame with bearings at both ends to receive the film from the film roll and a second pre-stretching roller (7) rotatably mounted on the frame with bearings at both ends and disposed in a position parallel to and at a distance from the first pre-stretching roller, which pre-stretching rollers are coupled together via a direct transmission (8) so that their circumferential velocities differ from each other, the pre-stretching of the film thus occurring within the film portion between the pre-stretching rollers as a result of the different circumferential velocities of the pre-stretching rollers; a pendulum roller (9) disposed after the second pre-stretching roller in the direction of film movement to receive the pre-stretched film from the second pre-stretching roller, said pendulum roller being spring-loaded with a spring (10) acting against the drawing direction of the film web; and a deflecting roller (11) mounted by both ends with bearings on the frame, in a position parallel to the pre-stretching rollers and the pendulum roller, the film web coming from the pendulum roller being passed over the deflecting roller to the article being wrapped, characterized in that the supporting elements (4) are mounted on the frame (3) with bearings permitting free rotation so that the film roll supported by them is freely ro-

tatable; that the pre-stretching rollers (6, 7) are mutually engaged and mounted on the frame with bearings so as to be freely rotatable; and that the pendulum roller (9) and the spring force of the spring (10) have been so adapted that the pendulum roller (9) forms between the second pre-stretching roller (7) and the deflecting roller (11) a bend acting as a film supply which contains a varying amount of film, depending on the prevailing draw of the film, to keep the drawing velocity and tension of the film substantially constant at the pre-stretching rollers regardless of the variation in the draw and velocity of the film in relation to the film dispenser that is caused by the shape of the article being wrapped.

2. Apparatus as defined in claim 1, characterized in that the pendulum roller (9) comprises a diverting element (12) which is parallel to the pre-stretching rollers (6, 7) and the diverting roller (11), the film (F) being passed over said diverting element, pendulum arms (13) connected to each end of the diverting element (12) transversely to the longitudinal direction of the diverting element, a turn arbor (14) attached to the pendulum arms and pivoted on the frame (3), and a lever (15) attached to the turn arbor (14) and provided with a fastening element (16) for fastening the spring (10).

3. Apparatus as defined in claim 1 or 2, characterized in that the apparatus comprises limit stop elements (17, 18) for limiting the deflection angle of the pendulum roller (9) to a predetermined magnitude.

4. Apparatus as defined in claim 3, characterized in that the limit stop elements (17, 18) comprise a first limit stop element (17), which determines a first extreme position (I) of the pendulum roller (9), in which the film supply formed by it contains a maximum amount of film, and a second limit

stop element (18), which determines a second extreme position (II) of the pendulum roller (9), in which the film supply formed by it contains a minimum amount of film.

5 5. Apparatus as defined in any one of claims
1 - 4, characterized in that the spring
 (10), pendulum roller (9), pre-stretching roller (7)
 and diverting roller (11) have been so fitted with re-
10 spect to each other that the film tension remains sub-
 stantially the same regardless of the position of the
 pendulum roller, i.e. regardless of the amount of film
 in the film supply.

 6. Apparatus as defined in any one of claims
1 - 5, characterized in that the maximum
15 deflection angle of the pendulum arm (13) between its
 extreme positions is 60° ; and that, when the distance
 between the swing axis (14) of the pendulum roller (9)
 and the center axis of the diverting roller (11) is x ,
 then

20 - the distance between the center axis of the
 second pre-stretching roller (7) and the center axis
 of the diverting element (12) of the pendulum roller
 (9) equals $3.04 \cdot x$;

 - the distance between the center axis of the
25 diverting element (12) of the pendulum roller (9) and
 the swing axis (14) of the pendulum roller (9) equals
 $1.31 \cdot x$;

 - the distance between the center axis of the
 diverting roller (11) and the center axis of the sec-
30 ond pre-stretching roller (7) equals $1.73 \cdot x$; and

 - the distance between the swing axis (14) of
 the pendulum roller (9) and the center axis of the
 second pre-stretching roller (7) equals $2.62 \cdot x$.

 7. Apparatus as defined in claim 6, char-
35 acterized in that the distance x between the
 swing axis (14) of the pendulum roller (9) and the

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center axis of the diverting roller (11) equals 105.4 mm.

8. Apparatus as defined in any one of claims 1 - 7, characterized in that the spring (10) is a helical spring connected by one end to the lever (15) and by the other end to the frame (3).

9. Apparatus as defined in any one of claims 1 - 8, characterized in that the first pre-stretching roller (6), the pendulum roller (9) and the diverting roller (11) are in contact with the first side (19) of the film (F) while the second pre-stretching roller (7) is in contact with the second side (20) of the film.

10. Apparatus as defined in any one of claims 1 - 9, characterized in that the direct transmission (8) between the pre-stretching rollers (6, 7) is a gear transmission comprising a first gear (21), which is attached to the first pre-stretching roller (6), and a second gear (22), which is attached to the second pre-stretching roller (7).

11. Apparatus as defined in any one of claims 1 - 10, characterized in that the transmission ratio of the transmission (8) is of the order of 90%.